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ABSTRACTS OF ARI RESEARCH PUBLICATIONS
FY 1981

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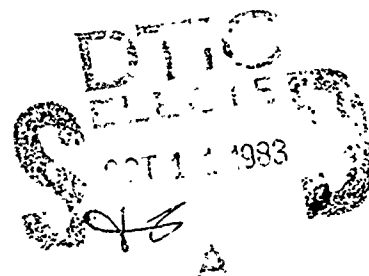


U. S. Army

Research Institute for the Behavioral and Social Sciences

May 1983

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A Field Operating Agency under the Jurisdiction of the
Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

L. NEALE COSBY
Colonel, IN
Commander

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FY 1981

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Abstracts

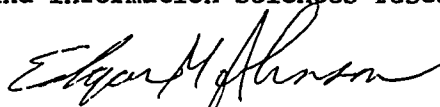
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FOREWORD

The Army Research Institute for the Behavioral and Social Sciences (ARI) publishes a series of abstracts that summarize the research on which final or interim reports have been published during each fiscal year. The series began in 1957. This Technical Report contains the abstracts for Research publications for FY 1981, October 1980 to September 1981.

During this period, ARI was the Army's agency for behavioral and social science research and a field operating agency under the Office of The Deputy Chief of Staff for Personnel. Independent laboratories and supporting operational field units working together provided a flexible research program on personnel utilization, training and evaluation, leadership and management, simulation systems, manpower and educational systems, human factors in systems integration, state-of-the-art computer technology, and information sciences research for the modern Army.



EDGAR M. JOHNSON
Technical Director

ABSTRACTS OF ARI RESEARCH PUBLICATIONS, FY 1981

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ABSTRACTS OF ARI RESEARCH PUBLICATIONS, FY 1981

INTRODUCTION

The present volume of abstracts, continuing the series begun in 1957, summarizes the research publications of the Army Research Institute for the Behavioral and Social Sciences (ARI) for the fiscal year 1981. Each volume of the series provides a synopsis of research efforts which reached publication stage during the period covered. The abstracts have been written, as far as possible, to describe the principal research findings in nontechnical terms; technical language is used to communicate efficiently the details of research analysis. Indexing by author and research area provides access to individual reports and topics.

Publication Categories

ARI Research publications are divided into separate, consecutively numbered categories appropriate to their intended audience and function. In FY1981 the following categories of technical documentation were represented:

Research Report: A report of completed research intended primarily for dissemination to military managers. Research Reports may deal with policy-related issues but typically do not include specific policy recommendations.

Technical Report: A report of completed research intended primarily for dissemination to researchers. Technical Reports should closely approximate journal articles in outline, technical scope, and level of detail.

Research Note: This may be either an interim or a final report, but is typically of limited interest outside of ARI and is not printed or distributed except to Defense Technical Information Center. Included in this category are in-house reports and appendix materials to Research or Technical Reports.

Research Product: A user-oriented document intended for distribution to field personnel. Examples are handbooks, manuals, and guidebooks. Non-textual materials which are intended to be part of a Research Product, such as computer cards, electronic storage discs, video or audio tapes or cassettes, and special types of packaging, should ideally be a contract "deliverable" and not something which needs to be duplicated by ARI as a separate effort.

Distribution of ARI Publications

Initial distribution of these reports was made directly by ARI. Research Reports, Technical Reports, and Research Products were distributed primarily to operational and research facilities and their sponsors in the Defense Department, to other interested Government agencies, and to the Defense Technical Information Center (DTIC), and were also sent to the Library of Congress, which sends documents to Federal depository libraries. Research Notes were deposited in DTIC, and are available only from DTIC or its coordinating agency, the National Technical Information Service (NTIS), in hardcopy or microfiche.

Qualified requesters may obtain copies of reports deposited in the Defense Technical Information Center directly from DTIC, Cameron Station, Alexandria, Va., 22314. Anyone may purchase documents from NTIS, Department of Commerce, Springfield, Va., 22161. The multidigit AD number given for each report is the accession number that should be used in requesting documents from DTIC or NTIS.

Research Reports, Technical Reports and Research Products may also be obtained on loan from depository libraries in many metropolitan and university centers. A list of these libraries is given at the end of this publication.

ABSTRACTS OF RESEARCH PUBLICATIONS

Research Reports

RR 1214. Armstrong, T. R., Farrell, W. S., & Card, J. J. (*American Institutes for Research*). Subgroup differences in military-related perceptions and attitudes: Implications for ROTC recruitment. October 1979. (AD A082 081)

A survey of 931 freshman and sophomore Reserve Officers' Training Corps (ROTC) cadets and noncadet students was conducted to provide (a) input to a national advertising campaign for ROTC, and (b) information to ROTC regional commands and professors of military science. Data were cross-tabulated according to ROTC membership, race, and sex. Subgroups were quite similar except in family income and type of home community. White non-ROTC students reported the highest family income, and black ROTC cadets the lowest. The overall favorite TV shows were Mork and Mindy, MASH, and 60 Minutes. The favorite radio programming was FM and rock. More ROTC cadets majored in physical/biological sciences and engineering. About 16% of the cadets gave "military officer" as their first career choice. A higher percentage of cadets than noncadets reported that people were influential on their decision to join ROTC, whereas more non-ROTC students reported that their personal beliefs and career goals were influential in their decision not to join ROTC. The majority of cadets had decided to join ROTC while still in high school.

RR 1229. Bell, D. B. Characteristics of Army deserters in the DOD Special Discharge Review Program. October 1979. (AD A078 601)

This report describes the characteristics and experiences of Army deserters participating in the Department of Defense (DOD) Special Discharge Review Program (SDRP) and draws inferences from the data about desertion during the Vietnam era.

Participants were divided into two groups: those who lived in foreign lands while absent without leave (AWOL) and those who did not. Those groups, in turn, were compared with other deserters and soldiers of the era.

Participants in the SDRP were not typical deserters of the time: 81% were exiles, compared with 1% to 5% for the era as a whole. The demographic profile of the exiles in the program was quite different from that of the typical deserters and from soldiers, in general, of the era. For example, compared with soldiers, the exiles were much more likely to be white, highly educated, and higher in mental ability. That finding was anticipated in view of similar findings in a reanalysis of data from President Ford's Clemency Program. Exiles were also less likely to have served in Vietnam. Compared with other deserters, they were much more likely to have left the Army for antiwar reasons and to have planned to desert rather than gone AWOL. In contrast, the nonexiled deserters resembled the "classic" deserter profile of this and previous conflicts.

These findings strongly suggest that the Vietnam era produced more than one type of deserter, a fact which should be kept in mind when describing the era.

RR 1236. Wellins, R. S., Rumsey, M. G., & Gilbert, A. C. F. Analysis of junior officer training needs. February 1980. (AD A096 034)

The objective of this research project was to insure that precommissioning training for Reserve Officers' Training Corps (ROTC) cadets is both comprehensive and relevant. ARI research teams interviewed and surveyed more than 1,300 officers, noncommissioned officers (NCOs), and enlistees in the field to (a) determine problems new lieutenants encounter in performing their jobs effectively, (b) evaluate the current ROTC curriculum, and (c) gather suggestions for improving precommissioning training.

Most problems described by junior officers and corroborated by NCOs and enlistees were of an interpersonal and organizational nature, such as relationships with subordinates, military justice, discipline, counseling, and command and leadership. The training and coursework cadets received in these areas were rated as extremely valuable. Analysis of the interview and questionnaire data suggests several ways to improve precommissioning training, including greater interaction with active Army personnel; more on-the-job experience before commissioning; the use of problem-oriented, realistic training; and more emphasis on interpersonal, "soft skill" training.

RR 1240. Maitland, A. J. Using predictor equations to assess potential performance of armor enlistees. January 1980. (AD A095 666)

This review examines research findings on predicting the performance of armor crewmen and shows how these findings may be applied in the current training program. Performance measures from two research efforts were combined and examined as a function of various levels of predictor test scores. The predictors were based on selected subtest scores from the Armed Services Vocational Aptitude Battery (ASVAB), which is administered to all enlistees. The performance scores were based on hands-on performance of specific armor crewman tasks. The results of various methods of assigning groups of enlistees to training programs illustrate the effects of different decision rules on the end-product of training. With the method of prediction supplied in this review, the performance potential of groups of enlistees may be assessed from readily available test scores, and the result of assigning these individuals to different training programs may be estimated. This method could result in more efficient use of human resources.

RR 1241. Freda, J. S. Army training technology transfer: A systems model. July 1980. (AD A097 047)

Innovations in training technology must be transferred from the researcher to the user to be effective. This systems concept paper presents a framework for the establishment of an Army training technology transfer program, as well as suggestions to improve the acceptance and use of training research products.

Training technology transfer is defined as the process by which research results become implements of useful change in operational training. The user can be civilian or military, functionally involved at levels from high-level review to the trainer in the field. The systems model developed here uses a

linear approach to describe the four steps of technology transfer in the Army: (a) analysis of requirements; (b) research, development, test, and evaluation (RDT&E) of solutions; (c) dissemination of findings; and (d) institutionalization. Within these steps, specific issues include assessment of military needs, consideration of the appropriateness of current RDT&E funding, user acceptance of new products, and the transition from innovation to policy, as well as prediction methodology and recommendations for on-going monitoring, evaluation, and feedback. Recurring throughout the transfer process are issues of sponsorship and the self-renewal capability of the research product.

A bibliography on training transfer is organized in terms of specific activities within the model.

RR 1243. Actkinson, T. R. Trainee and instructor attitudes toward one station and two station initial entry training. February 1980. (AD A100 975)

Trainees and instructors were queried as to their attitudes toward two initial entry training (IET) strategies: One Station Unit Training (OSUT) and Two Station Training (TST). OSUT was conducted solely at Fort Benning, Ga. TST was conducted at two locations, with the first 7 weeks of training at Fort Knox, Ky., and the last 5 weeks at Fort Benning, Ga. Analysis of results showed that TST trainee attitudes improved throughout training and that by the end of IET, TST trainees had significantly more positive attitudes than did OSUT trainees. Instructor results were mixed. However, OSUT instructors indicated they felt that the length of time between cycle breaks was too long.

RR 1244. Drucker, E. H. (Human Resources Research Organization); & Eaton, N. K. (ARI). The fifth tank crewman survey: The impact of additional tank crewmen on reported performance in armor units. April 1980. (AD A102 864)

Research was conducted to examine the impact of additional tank crewmen on reported performance in armor units, and to determine the degree of preference for alternative methods of organizing the additional crewmen. Questionnaires and interviews were administered to battalion commanders and subordinate leaders in 12 armor battalions in U.S. Army, Europe (USAREUR), each augmented in strength with the assignment of 54 additional tank crewmen, and in 6 battalions not augmented in strength.

The assignment of additional tank crewmen to the armor battalions resulted in reported improvements in quality of training, capability to perform adequately during a 72-hour sustained operation, unit readiness, and adequacy of support. Unit augmentation also resulted in reports of reduced turbulence. Partial improvements were reported in morale and quality of maintenance. The assignment of additional crewmen did not adversely affect (a) the reported capability of battalions to perform administrative actions, (b) adequacy of transportation, or (c) seriousness of command and control problems. The assignment of the additional crewmen directly to platoons was the most preferred alternative organization, while the assignment of the additional crewmen to battalion headquarters was the least preferred.

RR 1245. King, F. (Human Sciences Research, Inc.); Stein, E. S. (ARI); & Sevilla, E. R., Jr. & Seed, R. J., III (Human Sciences Research, Inc.). Artillery engagement simulation. May 1980. (AD A088 027)

A system was developed to integrate artillery units into engagement simulation (REALTRAIN, Multiple Integrated Laser Engagement System) field training. The system involved computing the impact point of artillery rounds from the data placed on the sights of the howitzers. This allowed realistic "marking" of simulated missions in the vicinity of maneuver troops. During a development test, an artillery battery "fired" 36 simulated missions. The battery improved its speed and accuracy while reducing its performance variability.

Participating artillerymen were enthusiastic and felt they had learned a great deal, indicating that the system was an effective training method in itself as well as a compatible component of overall combat field training. A draft training circular designed to be used by training managers of direct support artillery battalions is being produced as a result of this project.

RR 1246. Goodstadt, B. E. (Westat, Inc.), & Yedlin, N. C. (Advanced Research Resources Organization). First-tour attrition: Implications for policy and research. June 1980. (AD A100 957)

Current high levels of early personnel attrition are costly to the Army in terms of both recruiting and training requirements. This paper reviews state-of-the-art developments in research on attrition across the services.

Past research has characterized the causes of attrition as (a) within the individual who is discharged, (b) in the nature of the organization's policies and practices, or (c) different factors at different times during first enlistment. Consistent links have been found with individuals' characteristics, such as age and education, and with organizational policies. Future research should define and evaluate procedures for effective management of attrition. Specific research should be focused on areas where existing research seems to apply to policy. For example, attrition prediction tools may be applied to influence the Army's accession policies, or research findings may be utilized for developing training programs for line supervisors or may suggest ways of controlling attrition timing and trade-offs during first enlistment.

RR 1247. Rebane, G. J., & Walsh, D. H. (Integrated Sciences Corporation); Moses, F. L. (ARI); & Schechterman, M. D., & Levi, L. R. (Integrated Sciences Corporation). Dynamic displays for tactical planning. Volume I: User-oriented description. April 1979. (AD A096 953)

Volume I of the three-volume report describes an exploratory application of computer graphics with animation capabilities for two-sided, user-controlled, dynamic wargaming. The description is intended for Army managers, command staffs, and other potential users of the concepts. The project emphasizes that a battlefield planner/analyst can work in harmony with computer graphics to structure and analyze battlefield situations.

Preliminary procedures were developed that allow noncomputer personnel to create battlefield situations on displays and to assess changing events using dynamic replays and computer calculations of possible outcomes. Special displays allow the planner to see how terrain affects unit mobility and combat effectiveness. In addition, the use of dynamic replays of events and likely engagements helps the planner to interpret time and space relationships within scenarios. The aid has potential for allowing rapid evaluation of "what if?" battlefield questions.

Volume II, published as ARI Technical Report 455, is intended for readers with specialized interests in research and development of interactive graphics for battlefield applications. Volume III, ARI Research Note 80-9, contains detailed documentation for systems programmers/technical personnel who are interested in specifics of implementation.

RR 1251. Smith, S., Thompson, T. J., & Evans, K. (ARI); & Osborne, A. D., Maxey, J. L., & Morey, J. C. (Litton-Mellonics Systems Development Division). Effects of down-range feedback and the ARI zeroing target in rifle marksmanship training. June 1980. (AD A100 958)

Techniques were developed to provide knowledge of down-range rifle marksmanship results and to improve and simplify the process of zeroing the M16A1 rifle. These techniques were tested in a field experiment utilizing 2,124 basic rifle marksmanship (BRM) trainees at Fort Jackson, S.C.

Among male trainees, those who received either the ARI Zeroing Target or the Down-Range Feedback training were superior to control group trainees in record fire scores. Those receiving both ARI treatments were best, showing a 12.3% performance hit increase over controls. Female trainees did not show these results, but there appear to have been noncomparable samples among the four groups of women. In general, males in all groups had higher record fire scores than females.

Questionnaire data revealed that trainees who received the ARI Zeroing Target training were more knowledgeable about zeroing than were controls. Overall, however, trainees demonstrated poor knowledge of many marksmanship fundamentals.

These findings have been incorporated by the U.S. Army Infantry School and ARI in the development of an improved BRM training program soon to be implemented Army-wide.

RR 1252. Jeffrey, T. E. (Battelle Columbus Laboratories); & Martinek, H., Shvern, U., & Johnson, E. M. (ARI). ARI image interpretation research: 1970-1980. July 1980. (AD A095 661)

Image interpretation research conducted by the Army Research Institute has produced scientific data on improving the extraction of information from surveillance displays and on the efficient storage, retrieval, and transmission of this information. This report summarizes research on image interpretation completed by ARI between 1970 and 1980, organized according to nine major problem areas. The text presents, for each area, the rationale of ARI's approach to

the problem, findings, operational applications, and further research requirements.

The research areas are image interpretability, real-time and near real-time imagery interpretation, man/computer decision processes, change detection, mensuration and coordinate determination, training and proficiency maintenance, key development, and reconnaissance resource management and utilization. Continued utilization of these research findings can enhance the performance of the human component in current systems as well as provide information to system developers to help them provide design specifications for future systems and to determine areas needing further research.

RR 1253. Martinek, H. Summary of ARI research on remotely monitored sensors. July 1980. (AD A097 776)

The future battlefield will demand an increased ability to acquire, transmit, process, disseminate, and utilize surveillance and target acquisition information. One relatively new source of intelligence information is remote monitoring of the battlefield, using seismic, acoustic, and magnetic remotely monitored sensors (REMS). When enemy personnel or vehicle movement activates these remote sensors, a monitor display located behind our lines indicates the activity. The operator can derive from this display not only the enemy's presence but also such information as direction and speed of convoys and personnel, number of vehicles in a convoy, and convoy composition--e.g., armored versus wheeled vehicles.

This publication summarizes ARI research on REMS user problems, including direct operational applications of present and future utilization of REMS. Major findings are categorized into five areas--training, operator aids, operational procedures, REMS system design, and personnel requirements. The appendixes give information in the form of briefs for each pertinent ARI document.

RR 1255. Thompson, T. J., Smith, S., & Morey, J. C. (ARI); & Osborne, A. D. (Litton-Mellonics Systems Development Division). Effectiveness of improved basic rifle marksmanship training programs. September 1980. (AD A096 954)

The basic rifle marksmanship training program comparison took place at Fort Jackson, S.C., during the spring and summer of 1979. Improved periods of instruction were compared to provide the soldier in basic rifle marksmanship training with better skill acquisition. Emphasis on fundamentals, downrange feedback for error correction, and improved instructor-to-student ratios were critical added components of the three experimental programs compared to the current marksmanship training program.

The findings of the test showed that instructional changes contributed to significant record fire score improvements. The issue of instructor-to-student ratio changes remains uncertain without further training and testing of instructor personnel.

RR 1256. Myers, R. A., Cairo, P. C., Turner, J. A., & Ginzberg, M. (Columbia University). Cost-benefit analysis of the Officer Career Information and Planning System. August 1980. (AD-A097 085)

A prototype of a computer-aided manpower management and career progression system, the Officer Career Information and Planning System (OCIPS), has been developed to a point at which costs and benefits for its implementation can be estimated. Considering the goals of the Officer Personnel Management System and MILPERCEN's problems in pursuing those goals, the benefits likely to accrue from the implementation of OCIPS are described. A plan for evolving OCIPS from a prototype to an operational system is devised, and its costs are estimated. Various installation strategies, including various equipment alternatives, are compared. Estimates are also made for the costs of disseminating career information without computers.

RR 1257. Phillips, S. D., Cairo, P. C., Myers, R. A., Ryan, T. G., Hoffer, G. L., & Croes-Silverman, M. (Columbia University). Career planning modules for the Officer Career Information and Planning System. August 1980. (AD A100 959)

The Officer Career Information and Planning System (OCIPS) is an experimental computer-aided system designed to assist in the implementation of the Officer Personnel Management System. The career planning modules provide interactive dialog units which include an introduction to career planning (FORE-SIGHT), information about Officer careers (OVERVIEW), data about the process of alternate specialty designation (ALTERNATE SPECIALTY), practice in self-understanding (SELF-ASSESSMENT), and an opportunity to create long-term career goals and to translate them into plans for action (CAREER STRATEGIES). The conceptual bases for the design of the modules and a preliminary test of their feasibility are described.

RR 1258. Waldkoetter, R. O., & Milligan, J. R. Extension training materials: Differential perceptions among USAREUR lance missile personnel. April 1980. (AD A100 996)

Lance missile units in USAREUR (U.S. Army, Europe) were surveyed to determine the extent of extension training materials usage; preferred training modalities; training media mix and differential perceptions; and usage of extension training materials among officer, noncommissioned officer (NCO), and enlisted persons. Results indicated significant statistical differences among groups on numerous questions with definite preference and usage patterns for various extension training materials modalities.

RR 1261. Wortman, D. B., & Hixson, A. F., III (Pritsker and Associates, Inc.); & Jorgensen, C. C. (ARI). A SAINT model of the AN/TSQ-73 guided missile air defense system. January 1979. (AD A113 781)

The SAINT model of the AN/TSQ-73 system demonstrates the ability to incorporate the human element into a digital simulation model of a complex command and control system. The model is extremely versatile and can be used to evaluate the effect of both human performance characteristics and system operating

policies on overall system effectiveness for a wide range of mission scenarios. Continuing refinement and expansion of the model will enhance its ability to address complex issues associated with operator training as well as the design and operation of the AN/TSQ-73 system.

In its present form the model can be used to systematically vary battlefield scenarios and study the resulting effects on operator error rates, response times, and task performance sequences. Potential uses for an expanded version of the model include the identification of critical tasks based on simulated combat performance, resource or resupply bottlenecks, and optimal use of automatic or semiautomatic operational modes. A second-year effort is presently underway to develop improved psychological models of target identification, track hooking operations, and fire unit message handling.

RR 1262. , Allnutt, M. F. The FY 79 Individual Ready Reserve (IRR) aviator training program. April 1980. (AD A100 954)

This report presents findings from a survey sent to 94 Individual Ready Reserve (IRR) aviators who trained with active Army units in the summer of 1979 and those who trained them. The survey covered biographical information, the manner and extent of training, the apparent skill level of the aviators, and possible improvements to the training content and administration of the program.

RR 1265. Osborne, A. D. (Litton-Mellonics); & Morey, J. C., & Smith, S. (ARI). Adequacy of M16A1 rifle performance and its implications for marksmanship training. September 1980. (AD A100 960)

This document records firing test results for typical M16A1 rifles, providing data for simplified and improved marksmanship training procedures. Sixty rifles were selected at random and subjected to bench-type serviceability checks and accuracy firing tests. Following initial testing, a representative sample (good, average, and bad) of nine rifles was selected for the following tests: zero procedures, zeroing with the long-range sight, trajectory, rimfire adapter, effects of barrel stress, firer error, and firing by initial entry soldiers. This document is intended for marksmanship training developers and proponents of marksmanship hardware items. It should also be of value to those who want to become more knowledgeable about the capabilities of the M16A1 rifle.

RR 1271. Hagman, J. D. Effects of training task repetition on retention and transfer of maintenance skill. May 1980. (AD A101 859)

To help guide training course revision efforts of the U.S. Army Ordnance Center and School (USAOCS), this experiment examined effects of training task repetition on retention and transfer of maintenance skill. Five groups of 15 student Fuel and Electrical Repairmen, 63G Military Occupational Specialty (MOS), performed from zero to four repetitions on testing charging system electrical output using the 500A Sun Test Stand. Each group received test stand familiarization instruction followed by one level of task repetition. Retention was tested immediately and 14 days after training. Transfer to a different charging system was tested immediately after the delayed retention test.

Retention improved with task repetition and deteriorated over the inter-test retention interval. Significant ($p < .05$) overall test improvements in task time (20%) and errors (39%) first occurred after three repetitions, with no added benefit resulting from a fourth. Transfer was not affected by increased task repetition due to probable floor effects operating on the data. However, transfer was better after task repetition (1-4 repetition groups) than after familiarization alone (0 repetition group).

It was concluded that task repetition during training enhances retention of maintenance skill. Three repetitions are most effective, although this number will vary depending on training conditions. Transfer is best when training involves combined test equipment instruction and task performance.

This report is intended for military training personnel.

RR 1278. Funk, S. L., Johnson, C. A., Patzer, E., Gambell, T., & Vandecaveye, G. (McFann, Gray and Associates, Inc.); & Hiller, J. (ARI). Training detractors in FORSCOM divisions and how they are handled. May 1980. (AD A099 188)

This report describes how leaders from division level through company level view conditions that detract from combat training. Also described in this report are methods used to reduce the negative impact of training detractors.

The study also explored the impact of Department of Army imposed mandatory training on conducting effective combat training, and explored four resource areas (personnel, equipment and material, time, training areas and ranges) previously thought to be areas where detractors could be found.

Structured interviews were given to 198 personnel in six U.S. Army Forces Command (FORSCOM) divisions. The findings describe each detractor, its impact on training, and methods being used to reduce the negative effects of stated detractors.

RR 1281. Butler, A. K., Hoyt, W. G., & Leung, P. W. (System Development Corporation). Utilization of tactical computers for training: Job/task and training analysis. August 1975. (AD A115 891)

This report presents the Phase II results in the development of the Tactical Fire Direction System (TACFIRE) Automated Instruction (AI) courseware. The overall aim of this report is to extend the scope of the application of computer-assisted interaction to the development of self-instructive programs and procedures for users of tactical data processing systems. The purpose of the job/task analysis is to show the five functional areas selected for AI training and to report the results. These functional areas are technical and tactical fire control (FM); artillery target intelligence (ATI); ammunition and fire unit (AFU); support (SPRT); and system (SYS).

The job/task analysis conducted in this report is based on an analysis of TACFIRE documentation, and analysis of the system engineering of training documentation prepared by the U.S. Army Field Artillery School (USAFAS), discussions with TACFIRE personnel at USAFAS, and demonstrations of hands-on operations of the TACFIRE equipment.

RR 1282. Butler, A. K., Hoyt, W. G., & Leung, P. W. (System Development Corporation). Utilization of tactical computers for training: Job/task and training analysis--ammunition and fire unit (AFU) module. March 1976. (AD A115 941)

This report is an addendum to Research Report 1281. The functional area selected for research in this report is the ammunition and fire unit (AFU) area. This report presents the training analysis results for the complete AFU module; extending, incorporating, and integrating the previous analysis reported in Research Report 1281.

RR 1283. Hoyt, W. G., Butler, A. K., & Leung, P. W. (System Development Corporation). Utilization of tactical computers for training: Summary report. May 1976. (AD A115 876)

This is a summary of the four previous reports concerned with examining the feasibility of using computer-assisted instruction (CAI) as an embedded, individualized training program. This training program is to be used in instructing operational users of the Tactical Fire Direction System (TACFIRE) tactical data system. The TACFIRE courseware has been developed and produced in five functional areas consisting of independent modular blocks of instruction containing 44 PLANIT lessons and 10 performance-based module pretests and posttests totaling approximately 3,600 PLANIT frames.

RR 1284. Hoyt, W. G., Butler, A. K., & Leung, P. W. (System Development Corporation); & Germas, J. E., & Larson, J. T. (ARI). Development of CAI performance measures: TACFIRE tactical data system. June 1976. (AD A115 893)

This is the sixth and last report in the series which describes the utilization of tactical computers for training. This report summarizes the development of computer-assisted instruction (CAI) performance measures in the area of the Tactical Fire Direction System (TACFIRE) tactical data system.

RR 1285. Frye, C. H. (Northwest Regional Educational Laboratory). Extension of computer-assisted team training through coordinated lesson scenario. September 1977. (AD A109 193)

Several efforts were made in this research project to assist PLANIT authors in writing team lesson scenarios. Team training is defined early in this report, and then several specific authoring strategies are presented. A demonstration lesson is described in the text. The two most important products to come out of this research are contained in the appendixes. One is a set of recommended modifications to the PLANIT language which is designed to simplify the team authoring process. The other is a detailed set of authoring guidelines which should help conventional PLANIT authors to become "team" authors.

RR 1286. Frye, C. H. (Northwest Regional Educational Laboratory). Converting PLANIT lessons to enhanced FORMAT. September 1978. (AD A110 591)

This report relates the experience of converting 11,000 lines of Fire Mission PLANIT lesson scenario from conventional form to the enhanced PLANIT

FORMAT. Authoring difficulties are discussed along with proposed solutions. Among the problems discussed is the proper sequencing of operations, particularly in the areas of input and output.

This report concludes with several recommendations aimed at improving the human factors elements in authoring and in debugging the newly authored lessons.

RR 1288. Giesler, R. W., Harden, J. T., Best, P. R., & Elliott, M. P. (McFann, Gray and Associates, Inc.). Missions, responsibilities, duties, and tasks of infantry companies and field artillery batteries. September 1979. (AD A099 989)

This report describes the missions, job responsibilities, duties, and tasks of Rifle Companies, Combat Support Companies, Field Artillery Firing Batteries, and Field Artillery Service Batteries. The statements of missions, responsibilities, duties, and tasks for noncombat and combat activities and missions were obtained from published Army documentation. Where specific information was available, missions, responsibilities, duties, and tasks were identified from the Company/Battery level down to individual positions.

RR 1297. Ciley, C. D., Jr. (Canyon Research Group, Inc.); & Allnutt, M. F. (ARI). An experiment to evaluate the training potential of the Pilots' Night Training Device. September 1979. (AD A117 549)

Various constraints on low-altitude night flight have acted to restrict the ability of Army aviation unit commanders to train their aviators in the essential pilot skills required for successful night terrain flight. Use of the Pilots' Night Training Device (PNTD), which attenuates daylight and simulates the night visual scene, was tested in a controlled training situation. The posttest performance of two matched groups of Army aviators, one trained at night and the other trained using the device during the daytime, was compared.

The results indicated that the group trained in the daytime with the device performed at least as well as the group trained at night. These results have implications for expanded use of the device in field training.

Technical Reports

TR 384. Fischl, M. A., & Ross, R. M. Enhancing quality control in the testing of military applicants. April 1980. (AD A095 867)

Diverse sources of error must be controlled for aptitude tests to have substantial validity. This paper describes a highly cost effective procedure for immediate verification of the veridicality of operational test scores.

A continuous need exists to maintain the high quality of testing procedures and of operational test scores used in selecting and classifying enlisted personnel. In a large-scale testing program such as the one that uses the Armed Services Vocational Aptitude Battery (ASVAB), the risk of test compromise is always present. A cost-effective procedure for detecting the incidence of spurious scores was developed, consisting of (a) comparison of scores on two

ASVAB subtests to detect any large differences between them, (b) administration of a 10-minute retest to examinees showing the large difference, and (c) comparison of original and retest scores to verify the incidence of likely test compromise. Tryout of the procedure indicated that the 10-minute retest of fewer than 20% of all examinees could detect approximately 70% of all cases of test compromise.

TR 419. Jorgensen, C. C., & Strub, M. H. Analysis of manual Threat Evaluation and Weapons Assignment (TEWA) in the AN/TSQ-73 air defense system. October 1979. (AD A089 612)

As tactical air threats have increased, so has the need to efficiently coordinate ground defense. With the advent of computer-aided command and control systems, the identification of human strengths and limitations has become critical to the success of the Army air defense mission.

The research reported in this paper was conducted in 1975 during the early development of the AN/TSQ-73 missile minder. The missile minder is representative of a class of emerging air defense systems which place unusual demands on the processing capabilities of the human operator. The purpose of the research was to evaluate human operator performance under realistic task loading, aircraft threats, and manning configurations. As a result of this study, procedures were developed which can effectively be applied to assess operator performance under a wide variety of emerging air defense systems. The procedure can also be utilized to aid in firing doctrine development, assist human factors specification, and improve interoperability decisions in linked air defense systems.

TR 423. McBride, J. R. Adaptive mental testing: The state of the art. November 1979. (AD A088 000)

This paper defines adaptive mental testing in relation to conventional mental testing, outlines the major research issues in adaptive mental testing, and reviews the state of the art for each of the research issues. The research issues are (a) psychometric theory, (b) design of adaptive tests, (c) scoring adaptive tests, (d) the testing medium, (e) item pool development, and (e) advances in measurement technology.

TR 432. Siebold, G. L. The applicability of the ISD 4-factor model of job analysis in identifying task training priority in nine technical Military Occupational Specialties. October 1979. (AD A086 591)

The object of the research was to assess the applicability of the Instructional Systems Development (ISD) job analysis procedures to nine technical aviation maintenance Military Occupational Specialties (MOS). Job analysis questionnaires were developed for each of the nine aviation maintenance MOS. The questionnaires consisted of several background items and a list of tasks performed in the pertinent MOS. Research teams administered the questionnaires to groups of job incumbents and supervisors at numerous continental United States (CONUS) and overseas installations. About one-third of the incumbents and supervisors in each of the nine MOS completed the questionnaires. Job

incumbents rated their applicable tasks on a Relative Time Spent Performing scale. Supervisors rated all their MOS tasks on four scales: Task Learning Difficulty, Consequences of Inadequate Performance, Immediacy of Task Performance, and Type of Training.

The data indicated that the ISD 4-factor model of job analysis was applicable for identifying task training priority in the technical MOS. The four factor scales (Relative Time Spent Performing, Task Learning Difficulty, Consequences of Inadequate Performance, and Immediacy of Task Performance) correlated highly with the criterion scale (Type of Training) in all MOS. A further analysis was conducted by splitting the tasks into those expected to be done mostly by incumbents and those inspection, supervision, and management tasks normally done by noncommissioned officer supervisors. The four factor scales correlated very highly with the criterion scale for the incumbent tasks and moderately high for the supervisor tasks. Thus the rating policy of the supervisors was captured in each instance. However, since the relative influence of the factor scales varied by MOS, the training priority policy of supervisors appears to be MOS specific, and the model will have to be adapted individually for each specialty.

TR 433. Walizer, D. G., & Mietus, J. R. Development of an organizational survey feedback program for the 32d Air Defense Command. March 1980.
(AD A100 972)

In the U.S. Army's Organizational Effectiveness Program, the General Organization Questionnaire (GOQ) serves as the primary diagnostic survey instrument for measuring organizational climate. This project (a) tailored the GOQ and its automatic data processing (ADP) and feedback systems to the unique situation of the 32d Air Defense Command (AADCOM), and (b) examined the psychometric properties of the basic GOQ instrument.

The GOQ was tailored to the 32d AADCOM's situation. It was administered to more than 2,000 headquarters battery personnel in late 1977. Because there was no GOQ ADP system in U.S. Army, Europe (USAREUR) during the project, systems for processing data and returning results to commanders were built and then used. Interscale correlation and interitem reliability coefficients were computed. To help assess the impact of the procedures as viewed by commanders, a short evaluative questionnaire was used.

Five of six major indices of the GOQ were left intact; these measured unit climate, supervisory leadership, coworker interaction, and work group processes. Questions on norms and values, job satisfaction, personal adjustment, family life, and equal opportunity were added. Internal consistency scale reliability coefficients averaged .75. There was no curtailment in the range of item responses. Interscale correlation coefficients are higher than desired in an instrument used for differential diagnoses.

The data processing system was unwieldy but workable. Data feedback was to the top levels of the command, where it had policy impact; and to battery commander, where it had minimal practical impact, as perceived by unit commanders. Recommendations were to refine further the GOQ scales, make the tailored instrument available, replace the ADP system, and change the data feedback procedures. Feedback to unit commanders should be on "profile" forms; it

should provide norms for comparison; the commander and immediate subordinates should be involved in discussing the data in several long meetings.

TR 438. Medlin, S. M. (ARI); & Thompson, P. (University of North Carolina). Evaluator rating of unit performance in field exercises: A multidimensional scaling analysis. April 1980. (AD A089 264)

Statistical data analysis techniques were applied to expert judgments to explore systematic methods to incorporate expert military opinion into unit evaluation procedures. The research involved two related studies designed to define the major dimensions, or factors, that military judges use to assess unit performance in field exercises. In the first study, 15 military judges rated unit performance described in written narratives of 15 field exercises. These ratings were then analyzed using multidimensional scaling (MDS) techniques to determine how many dimensions the judges used to evaluate performance. The second study attempted to define, or label, the dimensions obtained in the first study. To do this, a list of possible dimension-defining attributes (adjectives or descriptive phrases) was composed, a new group of 30 military judges ranked the 15 narratives with respect to how much each narrative was characterized by the attributes, and these ratings were used as input to a second MDS analysis.

The results indicated that judges used only three dimensions to evaluate unit performance and that the dominant dimension was quality of overall performance. Subsequent interpretive analyses suggested that the weaker two dimensions were use of indirect fire and use of TOWs; when the dominant quality of performance dimension was eliminated, however, the secondary dimensions were (a) leadership functions, including coordination of elements, command and control, and exercise of leader functions; and (b) tactical skills, including use of indirect fire, quality of tactical plan, and use of tanks.

These results may be a methodological artifact due to insufficient information in the narratives or due to biases in the writing of the narratives. Performance on all aspects of unit tactical skills may change in unison, explaining the dominance of the quality of overall performance dimension. The judges may use only a generalized quality of performance dimension because they do not know what other dimensions to consider, how to assess performance on other dimensions, or how to assimilate information from other dimensions to arrive at a single evaluation of unit performance. Further tightly controlled research is needed to provide a rigorous investigation of the judgmental decision process.

TR 441. Hyman, A., Johnson, R. M., & Gade, P. A. Helicopter electro-optical system display requirements: I. The effects of CRT display size, system gamma function, and terrain type on pilots' required display luminance. March 1980. (AD A089 755)

Twenty-four Army helicopter pilots viewed videotaped segments of low-level and nap-of-the-earth (NOE) helicopter flights as presented on television monitors designed to simulate an airborne low-light-level television cockpit display system. While viewing these displays in an environment having no additional ambient illumination, these pilots were asked to set cockpit monitor luminance

at the lowest level that they judged would permit successful flight control over the terrain being overflown. Each pilot adjusted luminance levels for eight different display conditions formed by the factorial combination of display size, type of terrain, and object-luminance to display-luminance transfer function (system gamma function).

Results showed that pilots used lower luminance settings when viewing the larger of the two display sizes presented. They also used significantly lower luminance settings when viewing wooded terrain, with the system gamma function modified to provide "enhanced" contrast in the luminance range of interest, as against an unmodified system gamma function. The pilots' subjective impressions agreed with their measured settings. This report discusses the impact of these results on the specification of display requirements for a low-light-level television system for aiding night NOE flight.

TR 443. Johnson, R. M., Hyman, A., & Gade, P. A. Helicopter electro-optical system display requirements: III. The effects of CRT display size and luminance on dark adaptation of helicopter pilots. March 1980. (AD A088 527)

Previous research has indicated that pilots may be able to successfully use a television display of low luminance level as an aid to nighttime nap-of-the-earth helicopter flight. This experiment was conducted to assess the effects of display luminance level and display size on pilots' visual dark adaptation. Brightness matches made by 12 Army helicopter pilots were used to determine the magnitude of the dark-adaptation loss that resulted from viewing a 13-cm and a 26-cm cathode ray tube (CRT) display at relatively bright and dim luminance levels.

In the procedure used, one eye was light adapted to the CRT panel display, while the other eye remained dark adapted. Then, while the pilots viewed a simulated windscreen display, the luminance setting for the dark-adapted eye was adjusted independently until the display appeared equally bright to both eyes. Windscreen display luminance for the previously light-adapted eye remained fixed at a highlight brightness of 0.01 footlambert (equivalent to full-moon illumination). The larger display was judged to produce the greater dark-adaptation loss, even though the larger display could be successfully used at a lower luminance level. This result might have been due to the greater involvement of the peripheral rod retinal receptor cells when pilots made judgments following exposure to the larger light-adapting display. In such a case, selective attenuation of the blue end of the spectral energy output from the CRT phosphor could reduce the magnitude of the light-adaptation effect.

Under full-moon conditions, windscreen viewing within 1 second after light adaptation to a dim 26-cm television display showed a 67% loss in the apparent brightness of the windscreen display. This is equivalent to flying under one-third full-moon conditions. For a 13-cm panel display, the loss was only about half as great. The results also showed that even with a relatively bright display, almost complete recovery from light adaptation occurred within 2 minutes, for windscreen viewing under full-moon illumination.

TR 447. Maitland, A. J., Eaton, N. K., & Neff, J. F. Cross-validation of predictor equations for armor crewman performance. January 1980. (AD A095 662)

Cross-validation of armor crewman performance predictor equations was carried out on a sample of 335 trainees of the First Training Brigade, Fort Knox, Ky. Testing took place during and immediately following training. Some trainees were retested at their unit of first assignment. The predictor equations were also used with a sample of experienced tank crewmen, who were tested at the time of the trainee retesting.

The predictor measures were computed from subtest scores of the Armed Services Vocational Aptitude Battery, which were available in each enlistee's personnel records. Criterion measures were hands-on tests designed to measure crewmen's ability to perform the basic tasks (either driving the tank or firing the gun) as well as other MOS-specific tasks in maintenance and weapons preparation. A total of 130 drivers and 205 gunner/loaders were tested in Phase I, and 20 drivers and 60 gunner/loaders were retested in Phase II.

Phase I results indicated that the predictors were valid for driver and gunner/loader performance at the end of training. Phase II results indicated that the predictors were successful in most portions of the criterion measures for former trainees who were retested. Use of the predictors for the performance of experienced crewmen showed mixed results.

TR 454. Siebold, G. L. Discriminant function job analysis in three Army technical MOS. July 1980. (AD A097 682)

This report presents a technique to facilitate the determination of task training priority in Military Occupational Specialties (MOS). The job data analyzed consisted of scale ratings on tasks performed in three aviation maintenance MOS. Job incumbents rated MOS tasks they performed on a Relative Time Spent Performing scale. Supervisors rated all tasks in their MOS on four scales: Task Learning Difficulty, Consequences of Inadequate Performance, Immediacy of Task Performance, and Type of Training.

An examination of the criterion Type of Training scale revealed that the data produced were not normally distributed and that the Type of Training scale categories were at the nominal level of measurement. These Type of Training scale characteristics made standard multiple regression analysis less desirable than discriminant function analysis, which is more compatible with these particular characteristics. For the discriminant analysis, the seven response categories for the Type of Training scale were collapsed into two new categories: tasks to be trained at local units and tasks to be trained in a formal school setting.

The results indicated that the discriminant functions could classify tasks in the appropriate training category by incorporating the mean ratings per task on the four predictor scales. The discriminant function categorization agreed about 80% of the time with supervisor classifications based on the raw frequency of training choices. When there was disagreement in task training categorization, the supervisors' priority rating was typically anomalous. In practice, supervisors could be required to justify explicitly why they chose to deviate

from the computer-generated discriminant function classification. Besides capturing the underlying task training priority policy of the supervisor raters, the discriminant function technique also automatically draws lines for job analysts between tasks that should be taught in schools and those that should be taught in local units.

TR 456. ARI. Abstracts of ARI research publications, FY 1977. April 1980. (AD A088 267)

Abstracts and bibliographic citations, including the Defense Technical Information Center (DTIC) accession number, are given for 28 Research Reports, Technical Papers, Utilization Reports, and Technical Reports published by the Army Research Institute during FY 1977. To complete this record of research, abstracts or descriptions are included of 35 intra-agency Research Problem Reviews and Research Memorandums. All items are indexed by author and corporate author and by research area. The Federal depository libraries where the published reports may be obtained are also listed.

TR 457. Wheaton, G. R., Allen, T. W., & Johnson, E., III (American Institutes for Research); Drucker, E. H., Ford, P., & Campbell, R. C. (Human Resources Research Organization); & Boycan, G. G. (ARI). Methods of evaluating tank platoon battle run performance. May 1980. (AD A096 369)

This report describes the development of methods for the assessment of tank platoon battle run performance. The aims of this first phase were to generate objective performance measures, to explore alternative data collection procedures, and to specify scoring and interpretation procedures. Performance measures were developed for 54 different performance constructs in the offensive battle run and 43 different performance constructs in the defensive battle run. Videotaping of battle runs was explored as an alternative to traditional data collection procedures. The report concludes with a discussion of the procedures involved in using photomap board-gaming simulations to generate performance standards in terms of which to score and interpret platoon proficiency.

TR 459. Weinstein, C. E., Wicker, F. W., Cubberly, W. E., Roney, L. K., & Underwood, V. L. (University of Texas at Austin). Design and development of the learning activities questionnaire. August 1980. (AD A096 190)

This report describes the design and development of the Learning Activities Questionnaire (LAQ). This instrument was designed to identify types of learning strategies used by individuals in a variety of academic and training environments. After undergoing two pilot tests, the final version of the LAQ was administered to individuals at five different educational levels: graduate students, community college students, and three groups of Army trainees--high school graduates, general equivalency diploma holders, and trainees who had not completed high school. In 10 of the 15 major comparisons conducted, graduate students used each of the learning strategies significantly more than the other groups.

With the exception of rote methods, the three noncollege groups of Army trainees reported the lowest use of learning strategies. In general, rote

strategies appeared to be used frequently by all groups of respondents for most tasks. However, graduate students supplemented rote strategies with additional learning strategies. This was also true, although to a lesser extent, for community college students. It appears that learners at lower educational levels may not have developed a broad repertoire of learning strategies and depend, to a large degree, on rote strategies. This suggests the need for training programs designed to modify or enhance the learning strategies of students and trainees, particularly at lower educational levels.

TR 460. Weinstein, C. E., Wicker, F. W., Cubberly, W. E., Underwood, V. L., & Roney, L. K. (University of Texas at Austin). Training versus instructions in the acquisition of cognitive learning strategies. August 1980. (AD A098 462)

Three studies were performed to investigate the effects of training versus instructions in the acquisition of cognitive learning strategies. Groups of undergraduate students were taught to use one or more strategies. The amount and type of training differed for each of the experimental groups. Strategies taught included the method of loci, imagery, verbal elaboration, and grouping. Study and test materials included serial, free recall, and paired-associate word lists as well as reading passages. The results partially support the need for training, which includes practice and feedback, to facilitate the acquisition of cognitive learning strategies. However, the amount of training necessary to optimize learning appears to be dependent upon several factors, such as the difficulty level of the materials with which the strategies will be used and the types of tests used to assess what has been learned.

TR 461. Weinstein, C. E., Washington, T. P., Wicker, F. W., Duty, D. C., & Underwood, V. L. (University of Texas at Austin). The effects of material and task variations on a brief cognitive learning strategies training program. August 1980. (AD A098 463)

Two studies were performed to investigate the effects of material and task variations in the acquisition of cognitive learning strategies. Groups of undergraduate students were taught to use mental imagery, meaningful elaboration, and grouping. The type of training task or the order of training and test materials differed for each of the experimental groups. Study and test materials included free recall and paired-associate word lists as well as reading passages. The results partially supported the need for training materials to be ordered from easy to more difficult. However, the type of training necessary to optimize learning appears to be dependent upon several factors, including the difficulty level of the materials with which the strategies will be used and the types of tests used to assess what has been learned.

TR 462. Weinstein, C. E., Rood, M. M., Roper, C., Underwood, V. L., & Wicker, F. W. (University of Texas at Austin). Field test of a revised form of the cognitive learning strategies training program with Army enlisted personnel. August 1980. (AD A098 464)

A revised form of the Cognitive Learning Strategies Training Program was administered to Army enlisted personnel stationed at a large base in the Southwest. Program components included a motivation segment, an overview of the

training sequence, examples of the use of learning strategies in common situations, instruction in the use of the cognitive learning strategies included in this program, a review, and a series of posttests. A total of 108 junior enlisted personnel, representing 11 different companies, were assigned to participate in this research. Participants were divided into three groups of 36 men: training, control, and posttest-only. Training and testing materials were selected from secondary-school curriculum materials, an encyclopedia, and a newspaper, as well as from an Army technical manual. Training was conducted in three 1½-hour sessions separated by 3-day intervals. The first posttest was administered 3 days after the conclusion of the training, and the second posttest was administered 9 days later.

Analysis of the data obtained indicated that there were no significant differences among the three groups on either the first or second posttests. This was the first attempt to adapt the Cognitive Learning Strategies Training Program for Army recruits, and a number of modifications in both the program and the posttests used to evaluate it are needed.

TR 463. Weinstein, C. E., Underwood, V. L., Rood, M. M., Conlon, C. M. T., Wild, M., & Kennedy, T. J. (University of Texas at Austin). The effects of selected instructional variables on the acquisition of cognitive learning strategies. August 1980. (AD A098 429)

Three studies were conducted to assess the effects of type of training, amount of practice, and guided discussion in Cognitive Learning Strategies Training Programs. Undergraduate students were trained to use imagery, elaboration, and grouping strategies. Training that emphasized the process of creating learning strategies as well as the product (the strategy itself) demonstrated equivalent or superior results when compared to a program that emphasized only the process, and both were found to be superior to a program that emphasized only the product. Training that included practice using the strategies was found to be more effective than training without such practice. However, when practice included guided discussion of the strategies generated, performance on posttest tasks was adversely affected, possibly due to trainees' modeling the products presented in the discussion rather than the processes.

TR 464. Wicker, F. W., Weinstein, C. E., Underwood, V. L., Hukill, H. M., Duty, D. C., & Roper, C. (University of Texas at Austin). Depth, spread, and congruence of encoding in memory. August 1980. (AD A099 185)

Four studies were performed to evaluate the effects of depth, spread (elaboration), and congruence of encoding on memory performance. Undergraduate students of educational psychology were trained in one or several strategies for learning paired associates, word recognition, or free recall of words. The several strategies employed differed in the depth, spread, or congruence of the encoding required. Strategies which were assumed to emphasize depth or congruence of encoding were found to facilitate recall. Self-reported strategies were most likely to facilitate recall when they involved congruent encoding or were few in number.

Results were interpreted as providing support for the view that depth and congruence of encoding facilitates retention, but there was no evidence for a beneficial effect of spread of encoding. Postexperimental questionnaire data indicated, however, that one of the strategies taught was not widely used by participants. In view of this finding, a case for spread of encoding is still possible. Results emphasize the need to obtain independent data on the strategies which participants report as actually being used.

TR 465. Matlick, R. K., & Epstein, K. I. (Litton-Mellonics Systems Development Division). Alternative models for individualized Armor training. March 1980. (AD A102 866)

This report presents alternative generic models for the individualization of Armor training, along with a scheme for the classification and description of the instructional environments (contexts) of Armor training and a procedure for selecting alternative models for those environments and incorporating Instructional Systems Development procedures.

The classification scheme describes the contexts of instruction in terms of three fundamental dimensions: setting, focus of instruction, and time boundaries. Each context class is described in terms of the eight factors treated in the review and analysis of the literature: time available, instructional personnel, facilities, management, student population characteristics, course content/task types, instructional methods, and media/materials/devices. The sixteen alternative models of individualized instruction are built on four fundamental variables: instructional treatment, required proficiency, learning objectives, and time boundaries. Finally, the descriptions of context classes identify certain links between the context classes and the alternative models of individualized instruction.

TR 472. Jorgensen, C. C., & Hoffer, P. L. Early formulation of training programs for cost effectiveness analysis. July 1978. (AD A115 873)

The need to assess the impact of training on system life cycle impacts has led to the development of Cost and Training Effectiveness Analysis (CTEA). This decision-making strategy assumes a methodology by which the required support information can be generated. This report presents a CTEA technique for projecting media, method, and program efficiency prior to the development of well specified task lists. The report should be of particular interest to training analysts who are looking for a projection technique that can be specific enough to generate recommended training hardware and yet flexible enough to accommodate new CTEA technology and lessons learned from field performance.

TR 473. Eaton, N., Johnson, J. R., & Black, B. A. Job samples as tank gunnery performance predictors. September 1980. (AD A100 973)

This research was conducted to develop and evaluate job samples as predictors of tank gunnery performance. In Phase I of the research, two potentially useful job sample predictors were identified and validated. Phase II results provided cross-validation of these predictors. Subjects in Phases I and II consisted of recent Armor One Station Unit Training (OSUT) graduates.

Approximately one-half the subjects in Phase III were administered the job sample tests during their eighth week of training, while the remaining one-half were tested at the Fort Knox Reception Station, i.e., prior to training. Phase III results demonstrated that feedback had no effect on job sample-tank gunnery relationships; however, level of prior training did have an effect. Eight-week personnel performed at a higher level than reception station personnel on most job sample tasks. Results suggest that the job samples evaluated here offer promise in predicting performance after initial training and may be adaptable for use with the operational unit assignment process.

TR 475. Hopf-Weichel, R., Purcell, D., Freedy, A., & Lucaccini, L. (Perceptronics, Inc.). Adaptive decision aiding in computer-assisted instruction: Adaptive Computerized Training System (ACTS). September 1980. (AD A102 865)

This report describes the results of the first year's effort of a 3-year program to develop and evaluate a new Adaptive Computerized Training System (ACTS). This combines principles of artificial intelligence, decision theory, and adaptive techniques for teaching the procedures necessary to troubleshoot electronic circuits. ACTS emphasizes the realistic simulation of maintenance problems and focuses on enhancing the acquisition of decision-making skills which underlie successful electronic troubleshooting performance. The ACTS tracks a student's diagnostic and decision value structures, compares them to that of an expert, provides individualized feedback and help, and structures subsequent learning experiences. It is designated to facilitate transfer of these skills to an actual military environment. Preliminary studies indicate that the ACTS does teach students to make more effective decisions troubleshooting electronic equipment. A large-scale study to further evaluate the training potential of the ACTS, as well as to assess transfer to actual equipment following training with the ACTS, is planned for the second year.

TR 476. Price, H. E., Fiorello, M., Lowry, J. C., Smith, M. G., & Kidd, J. S. (BioTechnology, Inc.). The contribution of human factors in military system development: Methodological considerations. July 1980. (AD A101 877)

This document reports on an effort to determine (a) the conceptual basis for human factor contributions to military system development, and (b) the feasibility of an impact assessment methodology to measure the value of human factor research in system development. For these purposes, two parallel analytic processes were implemented.

One analytic process provided the conceptual basis for human factors in military system development. First, a rationale for human factors contributions and products was prepared. This rationale was further supported by policy documentation containing requirements for human factors research. The second analytic process provided the basis for evaluating human factor contributions. A review of cost-benefit analysis techniques applicable to human factors was performed together with a derivation of measurement metrics. These efforts resulted in a framework for performance of impact assessment and a determination that it is a feasible methodology for application to evaluations of human factors contributions to military system development.

This technical report provides recommendations for further refinement and validation of impact assessment in the measurement of the value of human factors efforts and products. Recommendations for developing human factors impact assessment handbooks are also provided.

TR 482. Shimoff, E. H., & Matthews, B. A. Instructional influence on human performance: Insensitivity to contingencies. August 1980. (AD A101 858)

To the extent that behavior is under the influence of instructions, it is insensitive to other consequences of the behavior. This phenomenon, termed instructionally induced insensitivity, was investigated with monetary reinforcement for button pressing by undergraduates. The data suggest that insensitivity is independent of response rate, and may occur despite contact with contingencies, although precluding contingency contact may delay the development of sensitivity. Instructions that the task involved problem solving did not necessarily induce insensitivity. Attempts at using multiple schedules suggested the role of verbal behavior even when responding was uninstructed. When subjects were required to make written guesses of the contingencies, accurate written reports usually preceded contingency-sensitive button pressing, but contingency-insensitive button pressing often persisted even after written reports were accurate.

TR 485. Sulzen, R. H. The effects of repeated engagement simulation exercises on individual and collective performance. August 1980. (AD A100 974)

This research measured individual and collective tactical performance in a series of engagement simulation exercises against novice opponents and with the same mission and terrain. The effects of engagement simulation training have been difficult to measure, since training normally has been conducted with varying missions and terrain against a constantly improving opponent. The results of this research indicate that collective tactical performance is improved by repeated engagement simulation exercises. In the specific conditions tested, rifle squad members defending against a series of 15 rifle platoons in a movement-to-contact mission tended to suffer increased casualties when they caused more casualties. Squad members varied considerably among each other in terms of casualties produced. The squad collectively improved over time in their rate of producing enemy casualties, but did not improve in avoiding enemy fire. The squad collectively inflicted more casualties from some defensive positions than would be expected by chance.

TR 490. Hays, R. T. Simulator fidelity: A concept paper. November 1980. (AD A101 475)

This report reviews the literature on simulator fidelity and shows that there is a great deal of confusion in the usage of the term fidelity. A two-aspect definition of fidelity is proposed which focuses on the physical and functional similarity of the training device to the actual equipment for which training is undertaken. This definition is discussed as it applies to several parameters of the training situation, such as type of task, trainee's stage of learning, or total training context, to determine training effectiveness.

Methodological issues in the empirical determination of fidelity requirements are discussed. A pilot research strategy to begin the empirical study of fidelity requirements is outlined.

TR 492. Hagman, J. D. Effects of presentation- and test-trial training on acquisition and retention of movement end-location. November 1980.
(AD A100 867)

The experiment examined relative effects of three training methods on acquisition and retention of movement end-location information. Three groups of 15 government employees performed three training trial cycles consisting of six trials each. Training methods differed in emphasis on presentation (p) and test (t) trials performed during each cycle. For one group, a cycle consisted of three p- and three t-trials administered in alternation. For another group, the first five trials of each cycle were p-trials and the sixth was a t-trial. For the last group, the first trial was a p-trial and the next five were t-trials. Group acquisition performance was compared at the last trial of each training cycle, while retention was compared 3 minutes and 24 hours after acquisition.

Absolute (unsigned) error revealed that final acquisition was better when training emphasized p-trial repetition or p- and t-trial alternation within cycles. Long-term retention was better when training emphasized t-trial repetition. It was concluded that testing is an effective way to improve long-term retention of motor skill and that improvements could be realized by changing the emphasis of training from presentation to testing. This could be done without added training resource expenditures.

TR 505. Siegel, A. I., & Wolf, J. J. (Applied Psychological Services, Inc.); Ozkaptan, H. (ARI); & Schorn, A. M. (Applied Psychological Services, Inc.). Human performance in continuous operations: Description of a simulation model and user's manual for evaluation of performance degradation. January 1981.
(AD A101 950)

User instructions and reference materials are presented for a computer simulation model which analyzes the PERformance Effectiveness of Combat Troops (PERFECT). The model allows analysis of anticipated performance effectiveness when variables such as continuous time in battle, light level, enemy/friendly numerical ratio, enemy/friendly terrain advantage, amount of platooning, and amount of sleep permitted are varied alone or in combination.

The model is designed for interactive operation at a terminal by a user with no or minimum sophistication in computer science or computer use. The primary output of the model is tables of personnel effectiveness degradation by day, type of combat unit, and each of five "combat factors."

Along with interpretive guidance, step-by-step procedures are presented for the preparation of model data and for running the model.

Research Notes

RN 80-17. Vallerie, L. L. (Dunlap and Associates, Inc.). Survey of task analysis methods. February 1978. (AD A096 868)

This survey of task analysis methods was performed as a first step in a program to advance the state of the art in methods used to identify the requirements for training devices. The survey included a review of the literature and interviews with industrial contacts. Identified task analysis techniques/methods are classified with respect to several descriptive categories (e.g., type of analysis, level of analysis, parameters used), and the procedures for application are summarized. Some government and industrial users of the techniques and recent system applications are identified. Based on review and analysis of the findings, a general method for task analysis on new systems is outlined, and the characteristics of a good analysis are identified.

RN 80-18. Brooks, R., & Samet, M. G. (Perceptronics, Inc.). Modern programming practices: Implications for human factors research. July 1979. (AD A096 874)

Future research directions on human factors in software must be sensitive to issues arising out of evolving software practice. Based on an historical distinction, these practices can be divided into two groups: conventional and modern. A series of reports prepared by six large software contractors on the impact of modern programming methods provides a useful source for evaluating the effectiveness of various practices. This paper critically analyzes selected contents of these reports and summarizes their conclusions as to the practical impact of modern programming practices. In light of the results of this analysis, a set of future research directions for work on human factors in software is then suggested.

RN 80-19. Katter, R. V., & Bell, G. (Operating Systems, Inc.). Experimental evaluation of concepts for MIQSTURE: An online interactive language for tactical intelligence processing. December 1979. (AD A096 875)

A project was undertaken to evaluate selected aspects of an online language for Army tactical intelligence processing called MIQSTURE. In the first of two experiments reported here, U.S. Army tactical intelligence officers provided expert judgments on work-related and information utilization aspects of descriptions of selected tasks from Army tactical intelligence processing. The results provided indications of which query methods have potentials as aids for intelligence analysts. In the second experiment, an evaluation was made of the efficacy of a familiarization/refresher display arrangement for developing and maintaining a useful level of user/operator familiarity with little-used but essential elements of the interactive language. The results were promising for the display arrangement.

RN 80-20. Kopstein, F. F., & Kingsley, E. H. (Institute for PsychoLogic); & Siebold, G. L. (ARI). Quasialgorithm methods and techniques for specifying objective job/task performance requirements. July 1978. (AD A100 435)

An exploratory project was conducted to assess the feasibility of establishing objective, empirically verified task descriptions or specifications (TS). Also, using the developed TS as a foundation, the possibility of erecting data structures (models) on them was investigated, as were mathematical techniques for extracting information from these models. In Part I the concept of quasi-algorithms is introduced and applied in task analysis. An account is given of the development and successful verification procedures for quasi-algorithmic TS of a number of field artillery fire direction center activities. These TS are listed. Improved procedures for routine development are outlined. Diverse uses of quasi-algorithmic TS, as such, are discussed. In Part II a mathematical model for structuring TS is presented. Abstract representation of TS in terms of attribute vectors is explained. A binary vector model is developed with reference to a TS from Part I. The concepts of dominance and cardinality are introduced, and it is shown how they structure any TS or set for TS. Applications to training, task taxonomy, duty assignments, career fields, etc., are outlined. The improved sensitivity of a model employing fuzzy subset theory is explained briefly.

RN 80-27. Hoyt, W. G., Butler, A. K., & Bennik, F. D. (System Development Corporation). Application of tactical data systems for training. Volume III: Development of courseware and analysis of results for MOS 11B40. January 1974. (AD A107 698)

This research report demonstrates that a complex computer-assisted instruction (CAI) system can be integrated within a tactical computer system and that learning does take place within the tactical computer environment.

While it is unreasonable to expect that a given method of instruction will be applicable to all Army personnel, it should at least cover a fairly broad range of personnel with varying aptitude (G) scores. These personnel present problems in regard to training costs. While student cost (time) is a consideration, instructor time (cost of preparation and instructing) is a more heavily weighted factor. A training program which has the capability to reduce instructor time in relation to student time offers a cost-effective, cost-saving approach to training.

RN 80-28. Hoyt, W. G., Butler, A. K., & Bennik, F. D. (System Development Corporation). Application of tactical data systems for training. Volume IV: Development of courseware and analysis of results for GED math. January 1974. (AD A107 530)

This research report demonstrates that a complex computer-assisted instruction (CAI) system can be integrated within a tactical computer system and that learning does take place within the tactical computer environment.

While it is unreasonable to expect that a given method of instruction will be applicable to all Army personnel, it should at least cover a fairly

broad range of personnel with varying aptitude (G) scores. These personnel present problems in regard to training costs. While student cost (time) is a consideration, instructor time (cost of preparation and instructing) is a more heavily weighted factor. A training program which has the capability to reduce instructor time in relation to student time offers a cost-effective, cost-saving approach to training.

RN 80-29. Hoyt, W. G. (System Development Corporation). Utilization of tactical computers for training: Analysis of system and training requirements. June 1975. (AD A107 531)

This report describes Phase V in the development of Tactical Fire Detection System (TACFIRE) Automated Instruction (AI) courseware. The overall project is aimed at extending the scope of computer-assisted instruction to the development of self-instructive procedures and programs for users of tactical data processing systems. This report covers the evaluation plan as such: procedures and methodology for performing a review of the TACFIRE courseware content, procedures and requirements for demonstrating the execution of TACFIRE courseware on the ARI and TACFIRE operating systems, and the procedures for assessing the acceptability of TACFIRE AI courseware by field artillery personnel.

RN 80-30. Hoyt, W. G., Butler, A. K., & Leung, P. W. (System Development Corporation). Utilization of tactical computers for training: Field evaluation plan. December 1975. (AD A107 316)

This report describes Phase V in the development of Tactical Fire Detection System (TACFIRE) Automated Instruction (AI) courseware. The overall project is aimed at extending the scope of computer-assisted instruction to the development of self-instructive procedures and programs for users of tactical data processing systems. This report covers the evaluation plan as such: procedures and methodology for performing a review of the TACFIRE courseware content, procedures and requirements for demonstrating the execution of TACFIRE courseware on the ARI and TACFIRE operating systems and the procedures for assessing the acceptability of TACFIRE AI courseware by field artillery personnel.

RN 80-33. Parrish, R. N., & Stevens, G. W. (System Development Corporation). Development of data processing strategies for potential application in the Tactical Operations System (TOS) and other tactical data systems. February 1979. (AD A107 532)

This report describes research to develop improved procedures/data processing methodologies for forecasting battlefield personnel attrition and for reporting logistics status. Two active Army divisions provided information on how the two latter-mentioned functions now are performed manually. This information provided the basis for the development of a data processing strategy concept which, if implemented in an automated tactical data system, should greatly improve the accuracy and timeliness with which the functions addressed can be performed. An experiment conducted with Command and General Staff College students confirmed that the timeliness and accuracy of the target functions would be significantly improved.

RN 81-2. Segal, D. R. (University of Maryland). Structural change in the U.S. Army. December 1979. (AD A100 887)

A series of theoretical and empirical analyses were undertaken to determine changes in the structure of military organization, the nature of military service, and the relationship between military organization and society since the advent of the all-volunteer force. We found that the structure of job-related attitudes among soldiers in the 1970s is similar to that among soldiers in the 1940s. The level of satisfaction, however, is lower today than it was during World War II. As was the case in World War II, black junior enlisted men today have somewhat higher job satisfaction than do white junior enlisted men.

Military personnel in the all-volunteer force define what constitutes a good job much like their civilian counterparts. Thus, military service has become a job as well as a calling to many. This fact is also reflected in the attitudes that high school seniors have toward military service, with notable variations on the basis of gender and of race.

Many of the traditional linkages between the military establishment and American society have been disrupted by the ending of conscription and the advent of the all-volunteer force, and there is evidence that career personnel retain few ties to the civilian community.

The papers summarized in this report are available as ARI Research Notes 79-23 through 79-29.

RN 81-5. Frye, C. H. (Battelle Columbus Laboratories). The feasibility of embedding Skill Qualification Testing software in one or more of six weapons systems. January 1981. (AD A098 235)

Previous research has validated the concept of Embedded Training (ET) by installing a powerful, machine transportable Computer-Assisted Instructional (CAI) authoring language and software system known as PLANIT (Programming Language for Interactive Teaching) on the field artillery's Tactical Fire Direction System (TACFIRE). Subsequent research demonstrated that the same hardware and software could be used for the administration of an embedded Skill Qualification Test (SQT). The purpose of this study was to determine the feasibility of transferring ET and embedded SQT technology to existing Army air defense weapons systems. Six air defense weapons systems were examined: TSQ-73, HAWK, FAAR, PATRIOT, ROLAND, and DIVAD. In general, the results indicated that it would be impractical to attempt to run PLANIT on any of the air defense weapons computers, but that PLANIT could be run on an adjunct computer and be made to satisfy the training/testing needs by using a fabricated terminal very similar to the authentic one. The development of such a prototype for an off-line embedded SQT capability could be produced for one of the selected air defense systems in a short time and for a relatively low cost. If successful, the resulting technology would have application not only to existing systems, but to new air defense systems to come into the inventory in the 1980s.

RN 82-24. Wright, B. D., & Mead, R. J. (University of Chicago). Rasch Model analysis with the BICAL computer program. September 1976. (AD A119 877)

The Rasch Model is the mathematical formulation of any measurement situation, either physical or psychological, for which the relevant statistic can be expressed in terms of the number of successes (or number of targets hit, items correct, or marks exceeded). The model specifies an efficient and reasonable way to make objective inferences from observations to variables. The concept and development of the model are discussed, emphasizing application to measurement of psychological variables. The BICAL program, a FORTRAN program to test the parameters, is described, with application to military police marksmanship data used as an illustration.

Research Products

RP 80-13. Schulz, R. E., & Farrell, J. R. (Human Resources Research Organization). Job aids: Descriptive authoring flowcharts for Phase I--ANALYZE of the Instructional Systems Development Model. May 1980. (AD A088 918)

The purpose of the research was to develop job aids ("how to do it" guidance) for the activities identified in the Instructional Systems Development (ISD) model (TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model--ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is composed of a descriptive authoring flowchart and a job aid manual. This volume covering Phase I--ANALYZE, contains an introduction to the use of the job aids, and the descriptive authoring flowcharts for Blocks I.2 through I.5. The supplementary job aid manuals for Phase I are available in a companion document.

RP 80-14. Schulz, R. E., & Farrell, J. R. (Human Resources Research Organization). Job aid manuals for Phase I--ANALYZE of the Instructional Systems Development Model. May 1980. (AD A088 919)

The purpose of the research was to develop job aids ("how to do it" guidance) for the activities identified in the Instructional Systems Development (ISD) model (TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model--ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is composed of a descriptive authoring flowchart and a job aid manual. This volume, covering Phase I--ANALYZE, contains an introduction to the use of the job aids, and the job aid manuals for Blocks I.2 through I.5. The descriptive authoring flowcharts for Phase I are available in a companion document.

RP 80-15. Schulz, R. E., & Farrell, J. R. (Human Resources Research Organization). Job aids: Descriptive authoring flowcharts for Phase II--DESIGN of the Instructional Systems Development Model. May 1980. (AD A088 417)

The purpose of the research was to develop job aids ("how to do it" guidance) for the activities identified in the Instructional Systems Development (ISD) model (TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model--ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL.

Each job aid is composed of a descriptive authoring flowchart and a job aid manual. This volume, covering Phase II--DESIGN, contains an introduction to the use of the job aids, and the descriptive authoring flowcharts for Blocks II.1 through II.4. The supplementary job aid manuals for Phase II are available in a companion document.

RP 80-16. Schulz, R. E., & Farrell, J. R. (Human Resources Research Organization). Job aid manuals for Phase II--DESIGN of the Instructional Systems Development Model. May 1980. (AD A088 920)

The purpose of the research was to develop job aids for the activities identified in the Instructional Systems Development (ISD) model (TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model--ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is composed of a descriptive authoring flowchart and a job aid manual. This volume, covering Phase II--DESIGN, contains an introduction to the use of the job aids, and the job aid manuals for Blocks II.1 through II.4. The descriptive authoring flowcharts for Phase II are available in a companion document.

RP 80-17. Schulz, R. E., & Farrell, J. R. (Human Resources Research Organization). Job aids: Descriptive authoring flowcharts for Phase III--DEVELOP of the Instructional Systems Development Model. May 1980. (AD A088 921)

The purpose of the research was to develop job aids ("how to do it" guidance) for the activities identified in the Instructional Systems Development (ISD) model (TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model--ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is composed of a descriptive authoring flowchart and a job aid manual. This volume, covering Phase III--DEVELOP, contains an introduction to the use of the job aids, and the descriptive authoring flowcharts for Blocks III.1 through III.5. The supplementary job aid manuals for Phase III are available in a companion document.

RP 80-18. Schulz, R. E., & Farrell, J. R. (Human Resources Research Organization). Job aid manuals for Phase III--DEVELOP of the Instructional Systems Development Model. May 1980. (AD A088 922)

The purpose of the research was to develop job aids ("how to do it" guidance) for the activities identified in the Instructional Systems Development (ISD) model (TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model--ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is composed of a descriptive authoring flowchart and a job aid manual. This volume, covering Phase III--DEVELOP, contains an introduction to the use of the job aids, and the job aid manuals for Blocks III.1 through III.5. The descriptive authoring flowcharts for Phase III are available in a companion document.

RP 80-26. Bedoian, J., Greiner, L. E., Schaefer, C. P., Schmidt, W. H., & Weingart, S. R. (System Development Corporation). Organizational case development manual. October 1980. (AD A094 176)

The manual is a guide for developing Organizational Effectiveness (OE) case studies. Two points are stressed: the techniques of obtaining and recording data, and the writing of the case in the most efficient and effective way. The manual is divided into three main sections: (a) the issues of client system sanction, confidentiality, and anonymity; (b) the problems of gathering, recording, and cataloging case data, and (c) guidelines for writing a primary documentation case and additional teaching cases.

RP 80-27. Rhode, A. S., Skinner, B. B., Mullin, J. L., Friedman, F. L., & Franco, M. M. (Information Spectrum, Inc.); & Carroll, R. M. (ARI). Manpower, personnel, and training requirements for materiel system acquisitions. October 1980. (AD A097 686)

The Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics has expressed concern over anticipated manpower needs for new materiel systems. The Department of Defense has revised review procedures and now requires detailed manpower planning information for the various stage of system review. This report analyzes the Army Life Cycle System Management Model process to determine its adequacy to develop manpower information. It concludes that the written process is sound but there are deficiencies in the system that require further study.

RP 81-1. Matlick, R. K., Berger, D. C., & Rosen, M. H. (Litton-Mellonics Systems Development Division). Cost and Training Effectiveness Analysis (CTEA) performance guide. July 1980. (AD A101 985)

This report provides procedural guidance for Army personnel tasked with the conduct of Cost and Training Effectiveness Analysis (CTEA). It provides strategies for planning the CTEA and provides illustrative methods to be adapted to the particular data availability situations of the CTEA analyst. The report includes a training cost model.

RP 81-2. Shiflett, S., Turney, J. R., & Cohen, S. L. Use of self-report technology in the development of an organizational action-research program. September 1979. (AD A103 209)

The research examined the dimensional characteristics of several self-report techniques of potential value in a diagnostic questionnaire to be used in Organizational Effectiveness (OE) research and intervention. A survey questionnaire administered to 320 enlisted personnel stationed in West Germany contained items from the OE-derived Work Environment Questionnaire and a variety of criterion measures of satisfaction and motivation. Analysis of the responses showed that the organizational variables fell into nine broad categories, of which two--quality of life and supervision--were significantly related to measures of satisfaction and motivation. The supervision factor primarily applied to job-related factors such as effort, while the quality of life factor concerned non-job-related factors such as intention to reenlist.

RP 81-3. McFarling, L. H., Blanton, R. L., Seed, R. J., & Sevilla, E. R., Jr. (Human Sciences Research, Inc.) Guidance for planning and conduct of field exercises at the maneuver company level. September 1980. (AD A100 985)

This document provides guidance for the preparation and conduct of conventional Field Training Exercises (FTXs) at the maneuver company level. Procedures are presented on the premise that the company is participating as an organic unit in an externally evaluated battalion-level FTX. General procedures and responsibilities of individuals designated to plan, prepare for, and conduct the FTX are discussed. The role of the senior controller/evaluator in preparing control/evaluation plans and preparing for and conducting controller/evaluator training is explained in detail. A complete program of instruction for training controller/evaluators is included. The program of instruction is based on the conduct of other planning and preparation procedures described in the document.

RP 81-5. Black, B. A., & Kraemer, R. E. XM1 gunnery training and aptitude requirements analyses. February 1981. (AD A102 885)

This research compared, by crew position and by task, the gunnery training and aptitude requirements of the XM1 and the M60A1 tank systems. Task inventories were prepared for each crew position in the XM1 as well as for tasks which required interaction among crewmembers. A comparability analysis identified XM1 tasks posing potential training or aptitude problems and proposed tentative solutions. In addition, the location where specific XM1 tasks would be trained was identified, e.g., in One Station Unit Training or in operational units. Findings from the XM1/M60A1 comparability analyses include: (a) the majority of XM1 tasks which are directly analogous to M60A1 tasks are easier to perform on a fully operational XM1 tank while performance of these same tasks on a non-fully-operational XM1 is almost identical in difficulty to M60A1 tasks; (b) tasks which are unique to the XM1 are often difficult on a fully operational XM1 and almost always very difficult on a non-fully-operational XM1; and (c) automation in XM1 equipment design has made operator task performance during normal target engagements easier, but has conversely increased the scope and complexity of preoperational tasks under normal and degraded conditions.

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DOCUMENTS EXPEDITING PROJECT

ALABAMA

68 University of Alabama Library
ATTN: Acquisition Department
University, Alabama 35486

ARIZONA

21-H American Graduate School of International Management
ATTN: Russell Sears
Thunderbird Campus--Library
Glendale, Arizona 85306

21-F Governments Documents Service
University Library
Arizona State University
Tempe, Arizona 85287

21 University of Arizona
Main Library
Government Documents Department
Tucson, Arizona 85721

CALIFORNIA

25 University of California, Berkeley
ATTN: General Library
Documents Department
Berkeley, California 94720

102 California State University, Chico
LIBRARY, Govt. Publications & Map Dept.
Chico, California 95929

- 52 University of California, Davis
ATTN: Library, Patricia Einouye, Doc. Libr
Documents Department
Davis, California 95616
- 104 California State University, Fresno
ATTN: Ms. Eloiss Wilson
Acquisitions Department
Fresno, California 93710
- 40 University of California, L. A.
ATTN: Library
Government Publications Room
Los Angeles, California 90024
- 97 Government Documents Department
Doheny Memorial Library
University Park-MC-0182
University of Southern California
Los Angeles, CA 90089-0182
- 66 California State University, Northridge
ATTN: Library
Government Documents
1811 Nordhoff Street
Northridge, California 91324
- 69 University of California Library, Riverside
ATTN: Government Publication Department
Riverside, California 92507
- 15 California State Library
ATTN: Documents Section
Sacramento, California 95809
- 42-B University of California at San Diego
ATTN: Catherine Grimm
Acquisitions Department
Central University Library, C-075-A
La Jolla, California 92093
- 63 San Diego State University Library
ATTN: Government Publications Dept.
San Diego, California 92182-0511
- Send List to:
Madeline L. Weintraub

- 67 University of California, Santa Barbara
ATTN: Library
Government Publications Department
Santa Barbara, California 93106
- 53 University of California, Santa Cruz
ATTN: Library
Documents Section
Santa Cruz, California 95060
- 71 Stanford University Libraries
ATTN: Joan Loftus, Federal Librarian
Stanford, California 92507
- 73 California State College, Stanislaus
ATTN: Library - Acquisitions Dept.
Turlock, California 95380

COLORADO

- 113 University of Northern Colorado
Government Publications Service - Library
Greeley, Colorado 80639

CONNECTICUT

- 111 Yale University Library
ATTN: Government Publications Collection
New Haven, Connecticut 06520
- 109 University of Connecticut
ATTN: Government Publications Department
Wilber Cross Library
Storrs, Connecticut 06268

DELAWARE

- 100 University of Delaware
ATTN: Library
Documents Department
Newark, Delaware 19711

DISTRICT OF COLUMBIA

- 38-B American University
ATTN: Library/Acquisitions
Washington, D. C. 20016
- 21-A Georgetown University
Government Documents Department
P.O. Box 37445
Washington, D. C. 20013
- 117 Johns Hopkins University Library
ATTN: Peter Promen
School of Advanced International Studies
1740 Massachusetts Ave., N.W.
Washington, D. C. 20036
- 39 U.S. Department of Justice
ATTN: Librarian
Civil Division Library
Main Justice Building, Room 3344
Washington, D. C. 20530

FLORIDA

- 121 Gale Research Company
1700 East Las Olas Blvd.
Fort Lauderdale, Florida 33301

GEORGIA

- 75 Emory University
ATTN: Serials and Binding Department
Robert W. Woodruff Library
Atlanta, Georgia 30322

HAWAII

- 101 University of Hawaii Library
ATTN: Ms. P. Sheldon, Head
Government Documents Collection
2550 The Mall
Honolulu, Hawaii 96822

IDAHO

48 University of Idaho
ATTN: Controller's Office
Room 101 AD Office Bldg
Moscow, Idaho 83843

ILLINOIS

17 Southern Illinois University
ATTN: General Library
Serials Department
Carbondale, Illinois 62901

112 Chicago Public Library
ATTN: Government Publications Department
425 N. Michigan Avenue
Chicago, Illinois 60611

85 University of Chicago Library
ATTN: Mr. Charles Helzer
1100 E. 57th St.
Chicago, Illinois 60637

7 University of Illinois
ATTN: Documents Section
Chicago Circle
P.O. Box 8198
Chicago, Illinois 60680

21-I Northern Illinois University
ATTN: Founders Memorial Library
Government Publications Department
DeKalb, Illinois 60115

60 Northwestern University Library
ATTN: Documents Division
Evanston, Illinois 60201

42 Western Illinois University
ATTN: Library
Documents Librarian
Macomb, Illinois 61455

- 37 Illinois State University
ATTN: Milner Library
Documents Department
Normal, Illinois 61761

- 29 Illinois State Library
ATTN: Government Documents Branch
351 Centennial Building
Springfield, Illinois 62756

- 36 Sangamon State University Library
ATTN: Documents Department
Springfield, Illinois 62701

- 43 University of Illinois Library
ATTN: Documents Library
200 D Library
1408 W. Gregory Drive
Urbana, Illinois 61801

INDIANA

- 88 Indiana University Library
ATTN: Alice Wickizer, Documents Librarian
Bloomington, Indiana 47401

- 82 Indiana State Library
ATTN: Documents Librarian
140 North Senate Avenue
Indianapolis, Indiana 46204

- 61 Purdue University Libraries
Serials Accounting
Acquisitions Department
West Lafayette, Indiana 47907

- 93 Ball State University
ATTN: Library
Muncie, Indiana 47306

- 92 Indiana State University
Cunningham Memorial Library
Serials Units
Terre Haute, Indiana 47809

Lists should be sent to:
Helen Schroyer, Documents
Librarian

IOWA

- 38-A Iowa State University
ATTN: Library - Government Publications
Ames, Iowa 50011
- 51 University of Northern Iowa
ATTN: Library - Serials - A
Cedar Falls, Iowa 50613
- 70 Drake University
ATTN: Cowles Library
Des Moines, Iowa 50311

KANSAS

- 10 University of Kansas Library
ATTN: Marion Howey, Documents Librarian
Lawrence, Kansas 66045
- 4 Kansas State University
Farrell Library
Government Documents
Manhattan, Kansas 66506

KENTUCKY

- 8 University of Kentucky
ATTN: University Libraries
Continuations Div., Acquisitions Dept.
Lexington, Kentucky 40506 0039

LOUISIANA

- 18 Louisiana State University
Business Administration/Government Documents Dept.
ATTN: Middleton Library
Baton Rouge, Louisiana 70803
- 119 Tulane University Library
ATTN: Government Documents Section
New Orleans, Louisiana 70118

MARYLAND

- 19 National Library of Medicine
ATTN: Technical Services Division S/A
8600 Rockville Pike
Bethesda, Maryland 20209
- 9 University of Maryland, McKeldin Library
ATTN: Documents and Map Room
College Park, Maryland 20742

MASSACHUSETTS

- 6 University of Massachusetts Library
ATTN: Serials Department
Amherst, Massachusetts 01002
- 31 Boston Public Library
ATTN: Serials Receipts
Boston, Massachusetts 02117
- 115 Tufts University
Fletcher School of Law and Diplomacy
Edwin Ginn Library
Medford, Massachusetts 02155
- 30 Mount Holyoke College
Williston Memorial Library
South Hadley, Massachusetts 01075

MICHIGAN

- 11 University of Michigan Library
ATTN: Documents Librarian
Ann Arbor, Michigan 48104
- 1 Detroit Public Library
ATTN: Book Receiving Department
5201 Woodward Ave.
Detroit, Michigan 48202

120 Gale Research Company
ATTN: Annie Brewer
Book Tower
Detroit, Michigan 48226

MINNESOTA

44 Minneapolis Public Library
ATTN: Order Dept.
Doc. Exped. Proj.
300 Nicollet Mall
Minneapolis, Minnesota 55401

21-G University of Minnesota Library
ATTN: Subscription Section
Serials Records
Minneapolis, Minnesota 55455

MISSOURI

91 University of Missouri Library
ATTN: Serials Department
Columbia, Missouri 65202

NEBRASKA

84 University of Nebraska Library
ATTN: Documents Librarian
Lincoln, Nebraska 68508

57-B University of Nebraska at Omaha
ATTN: Mrs. Elizabeth N. Seng
University Library, Order
Omaha, Nebraska 68181

NEVADA

21-E University of Nevada Library
ATTN: Steven D. Zink (Doc Ex)
Federal Documents Section
Government Publications Department
Reno, Nevada 89557

NEW HAMPSHIRE

- 28 University of New Hampshire
ATTN: Library Serial Department
Durham, New Hampshire 03824
- 62 Dartmouth College Library
ATTN: Reference Department
Hanover, New Hampshire 03755

NEW JERSEY

- 86 Rutgers University Library
ATTN: Government Publication Department
New Brunswick, New Jersey 08901
- 83 Princeton University Library
ATTN: Document Librarian
Princeton, New Jersey 08540

NEW MEXICO

- 42-C University of New Mexico
ATTN: General Library - GPMD
Charles A. Seavey
Albuquerque, New Mexico 87131

NEW YORK

- 72 Lehman College Library
ATTN: Acquisition Division
Serials Section
Bedford Park Bvd West
Bronx, New York 10468
- 49 Brooklyn College Library
ATTN: Prof. E. Svuksts
Documents Division
Bedford Ave. & Ave. H
Brooklyn, New York 11210

- 79 Brooklyn Public Library
ATTN: Technical Services Center
Acquisitions Department
109 Montgomery Street
Brooklyn, New York 11238
- 5 State University of New York at Buffalo
ATTN: Acquisitions Department
Lockwood Library Annex
Buffalo, New York 14260
- 35 Cornell University Library
ATTN: Government Documents
Ithaca, New York 14853
- 23 Columbia University Libraries
ATTN: Documents Service Center, Rm. 327
420 West 116th Street
New York, New York 10027
- 32 New York City Association of the Bar
ATTN: Library
42 West 44th Street
New York, New York 10036
- 22 New York Public Library
ATTN: Government Documents
Fifth Avenue and 42nd Street
New York, New York 10018
- 108 New York Public Library
ATTN: Book Ordering Office - Periodicals
455 Fifth Avenue
New York, New York 10016
- 16 Paul, Weiss, Rifkind, Wharton & Garrison
ATTN: Library
345 Park Avenue
New York, New York 10154
- Readex Microprint Corporation
101 5th Avenue
New York, New York 10003
- 118 New York Law School
Library - Government Documents
57 Worth Street
New York, New York 10013
Attn: Joanne Scala Gov. Docs Asst.

- 24 United Nations
ATTN: Dag Hammarskjold Library
Acquisitions Section
New York, New York 10163
- 21-B John Jay College of Criminal Justice
Library -- Acquisitions Department
445 West 59th Street
New York, New York 10019
- 105 State University of New York at Stony Brook
ATTN: Main Library
Documents Section
Stony Brook, New York 11790
- 64 Syracuse University Library
ATTN: Serials Division
Syracuse, New York 13210

NORTH CAROLINA

- 98 University of North Carolina-Chapel Hill
ATTN: Serials Department
Wilson Library 024-A
Chapel Hill, North Carolina 27514
- 12 Duke University Library
ATTN: Documents Librarian
Durham, North Carolina 27706
- 90 North Carolina State University - D.H. Hill Library
ATTN: Acquisitions Dept. (S)
Raleigh, North Carolina 27607

OHIO

- 20-A University of Cincinnati
ATTN: Main Campus Library
Serials Department (Documents)
Cincinnati, Ohio 45221

- 95 Ohio State University Libraries
ATTN: Documents Division
Main Library
1858 Neil Avenue
Columbus, Ohio 43210
- 87 Kent State University
ATTN: Documents Librarian
Kent, Ohio 44240
- 38 Miami University Library
ATTN: Jean Sears, Documents Librarian
Oxford, Ohio 45056
- 41 The College of Wooster
Government Publications Department
Andrews Library
Wooster, Ohio 44691

OKLAHOMA

- 14 Oklahoma State University Library
ATTN: Documents Librarian
Stillwater, Oklahoma 74078

PENNSYLVANIA

- 80 Free Library of Philadelphia
ATTN: Public Documents Department
Logan Square
Philadelphia, Pennsylvania 19103
- 54 Temple University
ATTN: Documents Room
Samuel Paley Library
Philadelphia, Pennsylvania 19122
- 81 Carnegie Library of Pittsburgh
ATTN: Serials Unit
4400 Forbes Avenue
Pittsburgh, Pennsylvania 15213

RHODE ISLAND

77 Brown University
ATTN: Library
Documents Division
Providence, Rhode Island 02912

SOUTH CAROLINA

47 University of South Carolina
ATTN: Order Department
McKissick Memorial Library
Columbia, South Carolina 29208

TENNESSEE

89 University of Tennessee Library
ATTN: Documents Librarian
Knoxville, Tennessee 37916

TEXAS

42-A Texas State Law Library
ATTN: Barbara Jo Seroto
P. O. Box 12367
Austin, Texas 78711

27 University of Texas
ATTN: Documents Librarian
Law Library
2500 Red River
Austin, Texas 78705-5799

34 University of Texas Library
ATTN: Central Serials Record
Austin, Texas 78712

21-J Texas A & M University
ATTN: Jan Swanbeck
Documents Division
Sterling C. Evans Library
College Station, Texas 77843

76 Dallas Public Library
ATTN: Documents Librarian
1515 Young Street
Dallas, Texas 75201

110 Baylor University
Library - Serials Department
P.O. Box 6307
Waco, Texas 76706

UTAH

20 Utah State University UMC-30
ATTN: Leona K Pisarz
Merrill Library - Ordering and Receiving
Logan, Utah 84322

21-D Brigham Young University
ATTN: Library
Documents Section
Provo, Utah 84601

2 University of Utah
ATTN: Serials Order Department
Documents Section
Salt Lake City, Utah 84112

VERMONT

13 University of Vermont
ATTN: Director of Libraries
Guy W. Bailey Library
Burlington, Vermont 05401

VIRGINIA

106 University of Virginia
ATTN: Public Documents
Charlottesville, Virginia 22903

- 103 George Mason University
ATTN: Acquisitions Librarian
4400 University Drive
Fairfax, Virginia 22030
- 21-C University of Richmond
ATTN: Ms. Judith B. Poynter, Library Assistant
Boatwright Memorial Library
Richmond, Virginia 23173
- 50 Virginia Commonwealth University
Government Publications Section
James Branch Cabell Library
901 Park Avenue
Richmond, Virginia 23284
- 107 College of William and Mary
ATTN: Documents Department
Swem Library
Williamsburg, Virginia 23185

WASHINGTON

- 46 Washington State Library
ATTN: Serial Section
Library Building
Olympia, Washington 98504
- 65 Washington State University
ATTN: Social Science Library
Pullman, Washington 99164
- 59 University of Washington Libraries, FM-25
ATTN: Serials Division
Seattle, Washington 98195

WISCONSIN

- 78 Milwaukee Public Library
ATTN: Serials Section
814 West Wisconsin Avenue
Milwaukee, Wisconsin 53233

OTHER

3 Bibliotheek Voor
 Hedendaagse Dokumentatie
 Parklaan 2
 B-2700 Sint Niklaas Waas,
 BELGIUM

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